ATTENTION DEFICIT HYPERACTIVITY DISORDER: DIAGNOSTIC ISSUES

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INTRODUCTION

Attention deficit hyperactivity disorder (also known as hyperactivity or hyperkinetic syndrome) refers to a constellation of behaviours arising from "an enduring disposition to behave in a restless, inattentive, distractible and disorganised fashion"⁽¹⁾. To make the diagnosis there must be abnormalities in either or both attention and activity which are excessive compared with the norm for a child of that age or developmental level, have been present from an early age (at least seven years but often identifiable by three years) and are pervasive, ie present in more than one area of a child's life (home, school, social situations etc). Medically the status of this diagnosis is that of a syndrome or disorder, not a disease, and none of the described behaviours is exclusive to the diagnosis. It also presents as a spectrum disorder, with less and more severe degrees, but it should be noted that the DSM IV classification requires evidence of clinically significant impairment of function. There are three main groups of symptoms: overactivity, inattentiveness and impulsivity.

Description

Most often, the hyperactive behaviour has become apparent when the child started to walk, but some parents (especially those with older children for comparison) realize, even *in utero*, that this child is unusually active. They are on the go all the time, unable to stay seated, or when they do sit, fidget excessively, they may climb dangerously or wander off, and are often accident-prone. They may interfere with or damage others' possessions or furniture and usually talk a lot, frequently interrupting, and behaving in a socially disinhibited way. Sustained concentration is difficult and they fail to finish things they start, and are usually very disorganized. Whether or not there is concern beforehand, starting school usually provokes a crisis, and many children are brought to professional attention at this stage.

Classification systems

Favoured in the USA but also widely used in Europe is the classification system of psychiatric disorders known as the DSM IV system (Diagnostic and Statistical Manual of Disease, American Psychiatric Association, fourth revision published in 1994).

Nine symptoms each of inattention and hyperactivity/impulsivity are listed (Table 1), of which six or more must be present for a diagnosis of *either* combined AD/HD or attention deficit disorder (ADD) alone, *or* hyperactivity disorder (HD) alone. It is also essential that some symptoms were present before the age of seven years, are present in more than one setting and are causing significant impairment (B, C and D in Table 1).

The International Classification of Disease, tenth revision

A EITHER 1 OR 2

- 1 Six or more of the following symptoms of inattention:
 - a) often fails to give close attention to details/careless mistakes
 - b) difficulty sustaining attention in tasks or play activities
 - c) does not seem to listen when spoken to directly
 - d) fails to follow through/fails to finish schoolwork, chores etc.
 - e) difficulties organising tasks or activities
 - f) avoids, dislikes or is reluctant to engage in tasks requiring sustained mental effort
 - g) often loses necessary things
 - h) easily distracted by extraneous stimuli
 - i) often forgetful in daily activities
- 2 Six or more of the following symptoms of hyperactivity/impulsivity:
 - a) often fidgets or squirms in seat
 - b) often leaves seat where remaining seated is expected
 - c) often runs about or climbs excessively in inappropriate situations
 - d) difficulty playing quietly
 - e) often "on the go", as if driven by a motor
 - f) often talks excessively

Impulsivity

- g) often blurts out answers before questions completed
 - h) difficulty awaiting turn
 - i) often interrupts or intrudes upon others (eg butts in)
- B Some symptoms causing impairment were present before 7 years
- C Some impairment present in two or more settings (eg school and home)
- D Must be clear evidence of clinically significant impairment in social, academic or occupational functioning.
- TYPES COMBINED
- Predominantly inattentive
- Predominantly hyperactive

Table 1 AD/HD DSM IV Criteria

(ICD 10, World Health Organisation, 1993) favoured by European psychiatrists, has devised more stringent research criteria for what is termed "hyperactivity syndrome" (Table 2). This requires some features from each group of symptoms for a firm diagnosis, or at least six of inattention, three of overactivity and one of impulsivity. This system does not allow for the separate category of attention deficit (ADD) alone.

Professor Eric Taylor, a leading UK researcher into hyperkinetic disorder, has recently described subtypes based on clinical practice, which is a useful additional framework (Table 3).

Prevalence

Although a large number of epidemiological surveys has been made, these cover different geographical areas and age groups, and use different criteria. As a result, widely differing prevalence rates are quoted. Earlier American studies, using DSM III criteria, quoted a prevalence as high as 6-7% of

I.C.D. 10 RESEARCH CRITERIA

Inattention (6)

Poor attention to tasks
 Poor attention to detail
 Apparently not listening
 Poor self-organisation
 Avoids tasks requiring sustained mental effort
 Easily distracted
 Does not finish tasks
 Loses homework, pencils, etc.
 Seems forgetful, but memory OK on testing

Overactivity (3)

Fidgets, squirms
 Leaves seat in class, meals, etc.
 Runs or climbs rather than walks
 Noisy, cannot play or work quietly
 Persistent overactivity, not moderated by social demands

Impulsivity (1)

Blurts out answers too soon
 Fails to wait turn
 Interrupts and intrudes on others' activities
 Talks excessively without response to social constraints

Table 2 AD/HD/Hyperactivity Syndrome

1 HYPERKINETIC DISORDER (ICD 10)

severe and pervasive hyperactivity in all situations
 present very early in life
 + (often) delays in language and motor coordination

Respond best to stimulants

2 MAINLY SCHOOL PROBLEMS

present after school entry
 less problematic at home
 disruptive, overactive
 poor concentration
 + learning difficulties (global or specific)

3 HYPERACTIVITY/DEFIANCE

plus depression
 may do better on antidepressants

4 HYPERACTIVITY/DEFIANCE

plus anxiety
 do less well with stimulants

Table 3 Subtypes of AD/HD (Eric Taylor)

schoolage children, whereas the more stringent ICD 10 research criteria suggest 0.5-1% (Table 4). Even this figure would mean 200 children with the disorder in an average district of 250,000 total population. The milder syndrome AD/HD would yield 2,000 children!

Males predominate: ratios vary from 10:3 male to female to 7:3, according to age.

A question currently frequently asked and, as yet, unanswered (and probably unanswerable), is whether AD/HD is actually increasing in incidence with time, or whether it is merely being more easily identified. We seem to be recognizing milder cases, especially those with predominantly attentional difficulties, which might once have been dismissed as non-specific behaviour disorders.

HYPERKINETIC SYNDROME (ICD 10)

0.5-1%

ADHD (DSM - III)

6-7%

ADHD (DSM-III-R, DSM-IV)

3-5%

SEX RATIO

Boys 10 : Girls 3 (Ages 4-11)

Boys 7 : Girls 3 (Ages 12-16)

URBAN AREAS > RURAL AREAS

Table 4 Prevalence of Childhood Hyperkinesia

Aetiology (Table 5)

There is no single specific cause for the disorder. Genetic studies have demonstrated increased concordance in monozygotic twins compared with dizygotic, and there seems to be an increased prevalence of the disorder amongst family members. It is suggested that 30-50% of the variation in hyperactivity may be due to genetic factors, but also that a genetic predisposition reacts with environmental factors in producing the disorder.

Some association with neurological disorders such as cognitive impairment, fragile X syndrome, birth trauma, dyspraxia and pervasive developmental disorders has generated interest in a single neurological cause. Investigation for structural damage by EEG or brain scans is unhelpful, with the exception of positron emission tomography (PET scanning), which has demonstrated underperfusion of the frontal lobes and basal ganglia. Similarly, investigations into the role of neurotransmitters including noradrenaline and dopamine have been confusing, even contradictory, so far. Contrary to common parental expectations, there is no helpful 'medical' test for AD/HD and most such children seem to be neurologically normal.

1 Cognitive impairment

2 Genetic influences (twin studies, siblings and parents, adoption etc.)

3 Structural damage, brain scans NAD except PET scans

4 Neurotransmitter changes, dopamine hypothesis

5 Diminished physiological responsiveness (non-specific)

6 Neonatal disease and injury (most severely affected cases)

7 Neurological illness (eg CP, fragile X, foetal alcohol syndrome)

8 Toxic and allergic factors, including food allergies

9 Psychosocial factors

Table 5 AD/HD Aetiology

Toxic and allergic factors, particularly high lead levels and food allergies, have been implicated, usually in sporadic cases. Although popular with parents, there is very little consistent evidence that AD/HD is caused (although some that it may be exacerbated) by any particular foodstuffs, especially dyes and preservatives. Carter *et al.*⁽²⁾ however, have found the "few foods" elimination diet to be of benefit to selected children.

Psychosocial factors are certainly relevant. Pervasive hyperactivity is linked to lower social class, although there is confusion with co-existing conduct disorder. An institutional upbringing is associated with inattentive, impulsive and socially disinhibited behaviour. The most robust association is with adversity in close personal relationships, eg marital discord, a hostile parent/child relationship, poor parental coping and excessive criticism.

Differential diagnosis (Table 6)

It is important to establish that the symptoms of AD/HD are appropriate to the child's developmental age and are not symptomatic of another primary disorder. The commonest confusion is with conduct disorder (multi-symptomatic antisocial behaviour). Conduct disorder is the most common presenting problem to child and adolescent mental health services, and antisocial symptoms such as lying, stealing, disobedience and various manifestations of aggression are often also associated with restlessness, impulsivity and school failure. To complicate things further, unrecognized and untreated cases of AD/HD commonly develop conduct disorder at a later stage. This makes it all the more important to take a detailed developmental history from parents, tracking the sequence of problematic behaviours. Children

- 1 Normal inattentiveness/overactivity for low intelligence/mental age
- 2 Conduct disorder
- 3 Disinhibited attachment disorder
- 4 Overactivity associated with autistic spectrum disorders
- 5 Anxious inattentiveness secondary to stress
- 6 Agitated depression
- 7 Past closed head injury or brain disease
- 8 Attention deficit without overactivity.

Table 6 Differential diagnosis of AD/HD

with primary conduct disorder are more likely to have adverse psychosocial backgrounds.

Emotional disorders such as pervasive anxiety and agitated depression can masquerade as hyperactivity, but are likely to be recent developments, and a careful history and examination of the child should clarify matters.

Comorbidity (Table 7)

Not all cases of AD/HD present in 'pure' form. A substantial minority, even at the time of first assessment, already has one or more comorbid conditions and the older the child is, the more likely this is. A very common comorbid condition developing at the younger ages and, unfortunately, once present, hard to treat and tending to persist, is oppositional defiant disorder (ODD) (Table 8).

Adults find it hard to manage children who develop ODD and they are generally unpopular with their peers. They are not likeable and often have a miserable time.

The association with conduct disorder has already been referred to. Later development of conduct disorder in children with established AD/HD seems to arise, at least in part, as their response to a habitually critical and negative attitude of the adults in their lives.

At an older age, many hyperactive children develop mood disorders, anxiety and depression arising in part from chronically low self-esteem.

- 1 Oppositional/defiant disorder
- 2 Conduct disorder
- 3 Anxiety/depression (low self-esteem)
- 4 Global learning disability (MLD or SLD)
- 5 Scholastic skills disorder ("dyslexia")
- 6 Specific language impairment
- 7 Development motor functions disorder ("dyspraxia")
- 8 Tourette's syndrome
- 9 Pervasive developmental disorders (eg autism)

Table 7 Comorbidity of AD/HD

- A Four or more of the following lasting at least six months:
 - 1 Often loses temper
 - 2 Often argues with adults
 - 3 Often actively defies or refuses to comply with adults' requests or rules
 - 4 Often deliberately annoys people
 - 5 Often blames others for his/her mistakes or behaviour
 - 6 Is often touchy or easily annoyed by others
 - 7 Is often angry and resentful
 - 8 Is often spiteful and vindictive
- B Disturbance in behaviour causes clinically significant impairment
- C Behaviours not during course of psychotic or mood disorder
- D Criteria are not met for conduct disorder.

Table 8 Oppositional defiant disorder

Finally, it is increasingly recognized that there is an overlap between AD/HD, Tourette's syndrome and pervasive developmental disorders, with some complicated children showing features of two or all three of these conditions, either simultaneously or at different times. Whilst it reinforces interest in seeking a neurological cause, such children are a very small minority of the whole range of children with hyperactivity.

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FURTHER INFORMATION

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